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# FEATURES OF INCOME FORMATION OF TELECOMMUNICATIONS MARKET ORGANIZATIONS

## ABSTRACT

The theoretical and methodological research presented in the scientific paper aims to identify the potential growth of the revenue level of participants in the telecommunications market, and the identification of potential opportunities and threats to ensure their economic security in order to define effective directions for the communications industry development in the long run.

As a result of the research, based on the identification of potential business opportunities, given the availability of potential and competence resources, it has been established that small participants in the communication market (operators) are not able to provide the appropriate level and continuity of service, therefore a significant part of customers switches to using the services of large market participants (providers), where the largest percentage of service provision is for wired Internet services.

The research was conducted on the materials of national telecommunications enterprises' activities results. The methodical basis of the research was general and special methods, namely: system analysis - for comprehensive consideration of strategic landmarks of telecommunications enterprises' activity; generalization and scientific abstraction - to study the level of readiness of enterprises for changes in management in the direction of innovative development; statistical analysis (method of standard deviation), synthesis and comparison - for the study of the domestic telecommunications market, in diagnosing the current state and trends of innovative development of domestic telecommunications enterprises, identifying priority development directions of innovative decisions in the direction of a revenue level formation of participants in the telecommunications market.

The main aspect of the results approved that an important and global task today for the telecommunication market development remains the implementation of start-ups for the reorganization, reconstruction, optimization and improvement of telecommunication networks, as a result of which there should be an innovative transition to the use of modern switching equipment in the direction of ensuring the high level of service for several numbering zones at once and maintaining accessibility to a wide range of services, which will make it possible to achieve a high level of profitability in the near future.

**Keywords:** telecommunications market, telecommunications enterprises, profitability of communication market operators, mobile communications market, telecommunications services, telecommunications operators, fixed telephone communication, mobile communication

**JEL Classification:** D89, F69, L10, L96, O39

## INTRODUCTION

Modern market conditions dictate new requirements for each business entity, where the primary focus is not only on ensuring resource potential, which is an extremely important issue for achieving the overall goal of ensuring the efficiency of functioning but also on solving the important task of successful strategic development for the long term. It is a well-known fact that the strategic development of any business entity is an essential condition for ensuring sustainable competitive positions in the target market. Enterprises in the service sector, which includes telecommunications enterprises, are no

exception, since the peculiarities of doing business and the final result of which directly depend on changes and impact of the external environment. Addressing the urgent issue of ensuring an adequate level of economic efficiency for the short and long term requires improving available approaches, as well as developing and implementing innovative approaches to the strategic development of enterprises operating in the target market.

It should be noted that in the current turbulent market conditions, the communications industry plays a special role in ensuring an appropriate level of national socio-economic development, formation of a sustainable and relevant resource and competence potential of the country, as well as a high level of informatization and intellectualization of society. Telecommunications provide management of public, production and non-production activities, and expand opportunities for communication, education, cooperation and collaboration, increasing the overall state of public awareness, while allowing for cost savings.

Global negative trends in economic development (the protracted economic crisis caused by the COVID-19 pandemic and martial law in the country) have a considerable and significant impact on the activities of domestic telecommunications enterprises, characterized by uncertainty in the functioning and development of key business processes, and the emergence of obstacles to the effective functioning and ensuring their economic security in the future. Accordingly, these trends contribute to the formation of an economic environment that is affected by risks of various kinds, which, on the one hand, create significant opportunities for successful development, and on the other hand, potential threats to their functioning. Given the current conditions, a necessary task of ensuring the effective functioning of telecommunications enterprises is to respond promptly to the impact of certain factors, which requires identification of the conceptual features of the telecommunications market development.

## LITERATURE REVIEW

A number of scientific works are devoted to the issue of telecommunications market research [5-6; 8; 14; 17-19]. The works of such well-known national scientists as V.O. Kulakov and V.O. Shchepelska are dedicated to the research of problems and prospects of the telecommunications market development [12]. Important aspects of the results of the research on economic and legal support for the functioning of the telecommunications market of Ukraine are highlighted by scientist Y. I. Ostapenko in the article "Tasks of legislative policy in the field of development of the telecommunications market of Ukraine" [18]. O. T. Patryak, in his own study of the development of the national telecommunications space in the direction of the development of the information society, considered important issues related to the search for promising ways and directions of development of the telecommunications market, determined the optimal correlation of industry development indicators with the general trends of national socio-economic development [19]. I.O. Sedikova, in her scientific work "Modern state of development of Ukrainian telecommunication space", considered the state of development of the information and telecommunications market of Ukraine [22].

Important issues of analysis of the telecommunications enterprises' financial state and crisis situation diagnosis in the field of communications sphere were investigated by such famous scientists as Chubar I. [2], Ivanchuk R. M. Ivanchuk, O. A. and Tolstop'iatov V. V. [10], Nasibova O. V. and Ivashkevich I. O. [16], Zahurs'kyj O. M. [27]. The result of increasing the level of intensity of competition in the telecommunications market, which contributes to the innovative development and growth of market participants, is consistent with the empirical findings of David Bardey, Danilo Aristizábal, José Santiago Gómez, Bibiana Sáenz [4], Cecere G., Corrocher N., Battaglia R. [1], as well as such well-known foreign scientists as Dastidar K. [3], Fransman M. [6], Karamti C., Kammou A. [11]. This is also consistent with the empirical findings of Lehr W. [14], Nekmahmud M., Rahman S. [17], Ru C., Gupta R. [21], Stone M. [23] and others.

While noting the significant contribution of well-known domestic and foreign scholars, it is considered necessary to identify the conceptual features of the telecommunications market functioning in order to determine the prospects for further development of the industry in general and telecommunications enterprises in particular.

## AIMS AND OBJECTIVES

The purpose of the research is to identify the potential growth of the revenue level of participants in the telecommunications market, and the identification of potential opportunities and threats to ensure their economic security in order to define effective directions for the communications industry development in the long run. based on the dialectical method of cognition of socio-economic processes, the formal and logical method, and using the method of system and statistical analysis (the method of standard deviation (absolute and relative)) will make it possible to determine potential threats to

the economic security of telecommunications enterprises, as well as to identify effective areas of development of the communications industry. To achieve the main purpose, the following tasks were specified, namely:

- analysis and investigation of the telecommunications market in the direction of diagnosis of the operators' entrepreneur activities, which is participating in the target market;
- analysis of fundamental trends in the formation of the profitability of providing communication services by operators participating in the telecommunications market.

## METHODS

The object of the research is the process of identifying the conceptual features and prospects of the telecommunications market and the prospects for its development. In solving this scientific task, general scientific and special research methods were applied, the main of which were the methods of system analysis; generalization and scientific abstraction - to study the level of readiness of enterprises for changes in management in the direction of innovative development; synthesis and comparison - for the study of the domestic telecommunications market, in diagnosing the current state and trends of innovative development of domestic telecommunications enterprises, identifying priority development directions of innovative decisions in the direction of a revenue level formation of participants in the telecommunications market.

The use of the statistical method of standard deviation (absolute and relative) based on the application of representative sampling made it possible to synthesize a reliable information database for analytical calculations.

## RESULTS

The telecommunications market is currently developing rapidly and covers a wide range of technologies and services. The main areas that determine its dynamism are noted as follows:

- *Mobile communications and online networks.*

Mobile communications continue to advance steadily, with a significant focus on the development of 4G networks and faster 5G networks. 5G technology offers significantly higher bandwidth with lower maintenance costs, enabling superfast Internet access, massive connectivity of Internet of Things (IoT) devices and access to other services (autonomous cars, augmented and virtual reality).

- *Internet of Things (IoT).*

Due to the large number of connected IoT devices, the demand for telecommunications solutions and services is growing. This category includes smart homes, smart cities, the healthcare industry, autonomous transportation systems, and much more. The development of IoT requires the expansion of network infrastructure and the creation of more resilient and reliable networks capable of processing large amounts of information data.

- *Shared database services and storage.*

As the volume of data generated, systematized, analyzed and used in various areas of business, including media, business processes and personal use, is increasing, the demand for general data provision and storage services is also growing. Legal entities and individuals are increasingly turning to public platforms for storing, processing, and exchanging data. This requires the development of high-speed data centre networks, as well as ensuring data security and confidentiality.

- *Artificial intelligence and data analytics.*

In the telecommunications sector, artificial intelligence and data analytics play an important role, as there is a clear trend of business entities switching to machine learning algorithms and artificial intelligence to improve customer service, automate business processes, detect fraud and optimize network infrastructure.

- *Development of wireless technologies.*

In addition to the development of the 5G network, the role of various wireless technologies, such as Wi-Fi 6 (802.11ax), which provides high data transmission speeds and better performance when the network is heavily loaded, is increasing.

In general, the dynamics of the telecommunications sector are characterized by rapid technological progress, increased volumes and accelerated data transmission speeds, as well as diversification of services provided to both target consumers and enterprises. As of today, telecommunication is positioned as an intensive and powerful component of the national

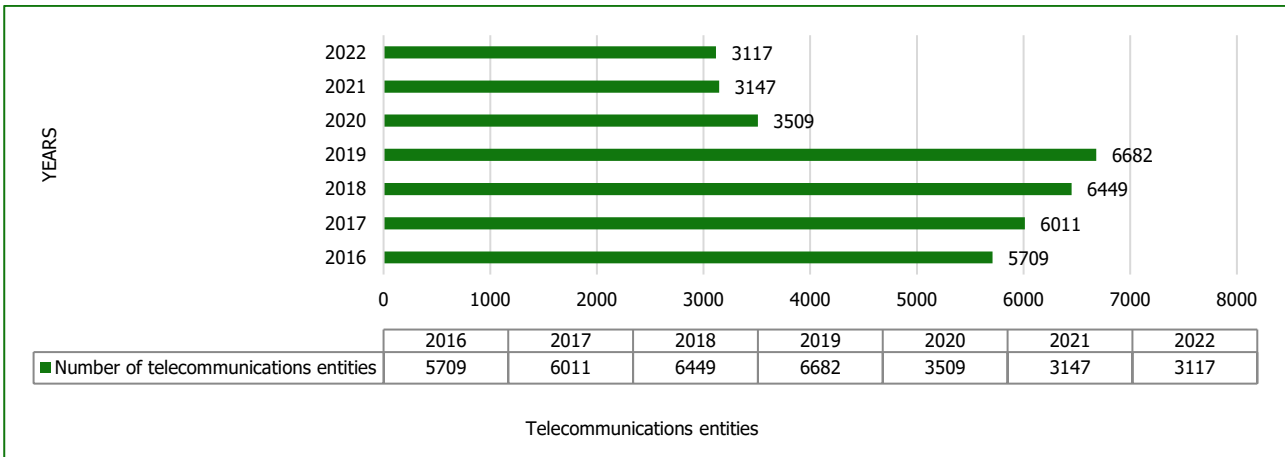
telecommunications industry, combining a set of network communications (technological systems) used to transmit various databases and types of information. This, in turn, plays an important role in the formation of the information society and ensures the development of communication means and their availability to all segments of the population in order to ensure the socio-demographic effect i.e., creating comfortable living conditions, increasing the level of access to various information flows, communication and intellectualization of society. In such conditions, it should be noted the importance of telecommunications development based on the following features [5]:

1. **Speed and efficiency.** Telecommunication provides fast and efficient communication between individuals, organizations and nations and enables the exchange of information and ideas, keeping in touch with family and friends, and conducting business negotiations, which plays an important role in business development by providing corporate and global communication.
2. **Accessibility.** Providing access to the huge amount of information stored on the Internet is one of the key elements of the information society, where information is considered a valuable resource in the information society. The free flow of information facilitates the free expression of public opinion in public debates, ensures prompt monitoring of news and analytical information, and enables the development of personal knowledge and active participation in the socio-political and cultural life of the country. Telecommunication enables remote work, virtual conferences, and management and control of production processes.
3. **Complexity.** Ensuring the complexity of the relationship between organizational structures and suppliers (B2B), enterprises and the target audience (consumers) (B2C), telecommunication contributes to the development of e-commerce and digital marketing.
4. **Feasibility of use in the sphere of education and science.** Providing access to online learning materials, enabling distance learning and the use of electronic libraries, makes it possible to obtain education and improve skills during a pandemic and martial law, regardless of geographic location or social status.
5. **Security.** Public access electronic communication networks are the basis for prompt and immediate notification of the population about emergencies and threats related to them, for emergency and immediate response in cases of threats to the life and health of the population; awareness of decisions of the top level of government, military administrations and local governments, addressing citizens throughout Ukraine. At the same time, the availability of telecommunications provides a means of communication for organizing rescue operations, coordinating actions and ensuring security, as it makes it possible to receive assistance from law enforcement agencies and monitor public places through video surveillance systems.

Considering that the use of communication facilities and services is an essential condition for ensuring efficient activities in almost all areas of management, it becomes especially important to address the issue of quantitative and qualitative characteristics of the provided communication services in the context of current trends in their state and development.

The Law of Ukraine "On Electronic Communications" states that "...electronic communication service is a service consisting of receiving and/or transmitting information through electronic communication networks, except for services with editorial control over the content of information transmitted through electronic communication networks and services" [1]. In other words, electronic communication service providers are telecommunications operators or providers. At the same time, as at 31.12.2021 (i.e., according to the previous Law of Ukraine "On Telecommunications"), it was clearly defined that "...a communication provider is a business entity that has the right to provide access to the Internet without the right to maintain the network" and, as a rule, requires an agreement with an organization licensed to maintain the network owned or used by the provider [12].

In this aspect, it should be mentioned that in terms of the level of development of the industry, Ukraine is far behind the developed countries of the world. That is why the identification of key areas of development of the telecommunications industry and the determination of its peculiarities are necessary in terms of forming a general study of the telecommunications market. The number of business entities included in the register of operators, telecommunications providers and those providing telecommunications services of mobile communication to consumers is more than 3000 units [18] (Figure 1).

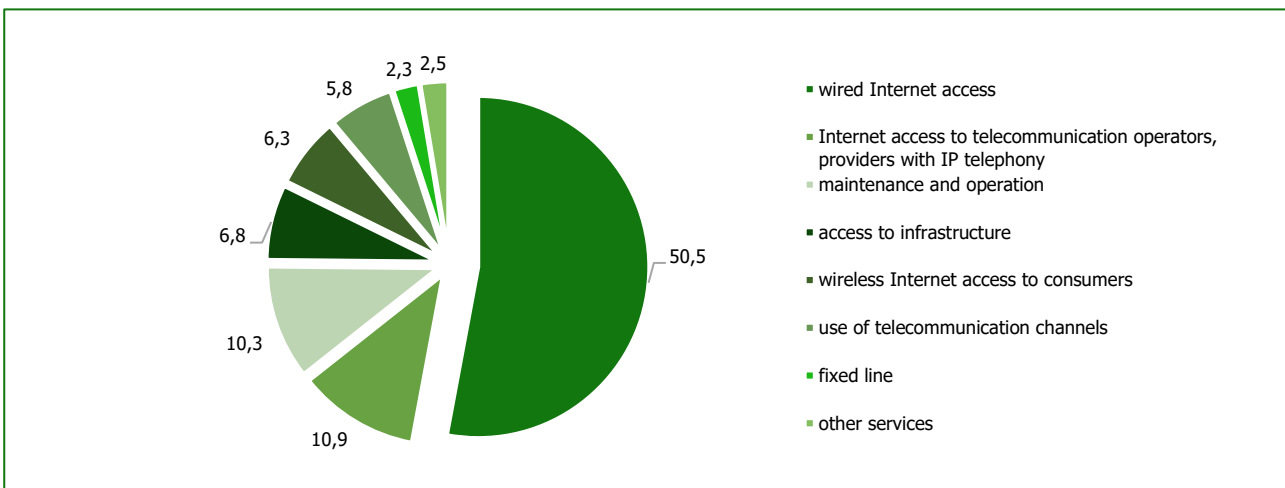


**Figure 1. Dynamics of key participants of the communication market from 2016 to 2022.** (Source: compiled by the authors based on source [7-9])

The analysis of Figure 1 shows a significant reduction in the number of telecommunications operators and providers during the research period compared to 2019 when there was a positive trend. Over the past years (2020-2022), the number of telecommunications market participants has decreased by almost 47%. This trend is explained by the high level of competition in the industry, and increased monopolization, which ultimately leads to a loss of revenue in the face of restrictions (COVID-19). During the transition to remote work and online education, the requirements of customers for the quality and stability of Internet access have increased significantly. The full-scale invasion of the Russian Federation led to large-scale destruction and damage to electronic communications across the country, especially in areas and cities where active hostilities were taking place.

Small telecommunications market participants (operators) are unable to ensure the proper level and continuity of service, so a significant number of customers are switching to the services of large market participants (providers). In addition, in 2020, mobile operators PJSC VF Ukraine, PJSC Kyivstar and LLC Lifecell obtained licenses to implement a new radio technology, International Mobile Telecommunications (IMT), in the 900 MHz radio frequency band, which allowed them to start deploying 4G networks in the designated band. As a result of these structural and organizational changes, the coverage area of 4G networks in Ukraine was significantly expanded, which led to a significant increase in the number of consumers able to receive broadband access to the World Wide Web [10].

Through the combined efforts of the seven leading operators of the electronic communications market (PJSC Kyivstar, PJSC VF Ukraine, LLC Lifecell, JSC Ukrtelecom, PJSC Datagroup, LLC Atracom, LLC Eurotranstelecom), it was possible to significantly increase the level of provision of their own switching units (centres) and mobile base stations, backup autonomous power sources, namely batteries up to 255,967 units and generators up to 3,500 units [4; 9]. In terms of the percentage of service provision, the structure of the register of telecommunications entities is as follows (Figure 2).



**Figure 2. Percentages of services provision in the structure of the register of telecommunications.** (Source: compiled by the authors based on sources [7; 28])

By analyzing the structure of the register of large market operators (see Figure 2), it should be noted that the largest percentage of service provision is accounted for by wired Internet services (3.23 thousand market participants). Internet access services to telecommunications operators and providers, including IP telephony, are provided by 0.7 thousand business entities; 0.66 thousand telecommunications market participants provide maintenance and operation services to telecommunications enterprises; almost 7% are provided to telecommunications enterprises (0.43 thousand entities). More than 6% (0.4 thousand enterprises) provide wireless Internet access services and almost 6% provide telecommunication services.

Based on the dynamics of the development of the communication market in Ukraine for the period of 2018-2022 (Table 1), it can be concluded that the number of mobile subscribers will decrease in 2022 (by 6622 thousand) compared to 2021 [18].

**Table 1. Dynamics of the development of the communication market in Ukraine, 2018-2022.** (Source: calculated by the authors based on source [28])

Market participants	TOTAL					Growth rate (decline), %				
	2018	2019	2020	2021	2022	2018 to 2019	2019 to 2020	2020 to 2021	2021 to 2022	2018 to 2022
The number of subscribers of mobile communication, thousand units	54007	54843	53978	55926	49304	101.5	98.42	103.6	88.16	91.29
The number of subscribers of fixed telephone communication, thousand units	6069	4178	3314	2283	1739	68.8	79.32	68.9	76.17	24.95
The number of lines (points) of fixed access to the global Internet network, thousand units	6159	7265	7769	7566	7191	117.96	106.94	97.39	95.04	116.76

The analysis of Table 1 shows a negative trend in the development of the communications market in Ukraine, which is primarily due to the introduction of martial law in the country, during which the temporarily occupied territories lost access to mobile networks. At the same time, the number of fixed-line subscribers decreased by almost 75% compared to 2018. The rapid decline in the number of fixed-line subscribers is explained by the widespread use of mobile services. The gradual expansion of the geographical coverage of 4G and 5G networks is contributing to the replacement of traditional fixed-line telephony services, which is leading to a decline in consumer demand for all types of fixed-line telephony services.

In this regard, it should also be noted that a significant number of copper cables were damaged as a result of the full-scale armed aggression of the Russian Federation against Ukraine, which caused a high level of the evacuation of a large part of the population from the territory of hostilities. As a result of these processes, the subscriber base of fixed-line voice service providers decreased. In turn, the destruction of the infrastructure of electronic communication networks created a prolonged lack of communication for potential subscribers and related financial costs to repair the damage to these networks. The increase in the cost of fixed-line telephony services to almost the cost of mobile services gives priority to the use of mobile communications.

At the same time, the continued negative trend towards a decline in consumer demand for fixed-line telephony services provided via payphones resulted in the termination of such services by Ukrtelecom in 2020. The number of fixed Internet access subscribers decreased significantly (as at the end of 2022, it reached 7,191 units, which is 5% less than in 2021), which is explained by the lack of full reporting under martial law. As for 2018, this figure increased by more than 16% [7].

The priority in the market is mobile communication, the volume of which is constantly increasing, giving preference to quality, mass use, accessibility and adaptability to the individual needs of each user. The realization of potential opportunities is ensured not only by improving existing networks but also by implementing new technical and technological solutions based on the formation of a global network infrastructure. As of the end of 2022, the population of Ukraine had 143 active mobile network identification cards per 100 inhabitants, which indicates a high level of mobile penetration in Ukraine. The highest rate was recorded in the Kyiv region and the lowest in the Ternopil region.

In 2020, the telecommunication networks of such mobile operators as Intertelecom LLC and TriMob LLC were reduced. It should be pointed out that at the beginning of 2020, TriMob LLC returned almost all available radio frequency resources to the state, leaving only the radio frequency resource for Kyiv in its own use, which resulted in an almost complete

reduction of the 3G network of the operator, while providing telecommunications services to consumers using national roaming [2-3].

Since September 2020, Intertelecom LLC has limited the provision of services in a number of regions of Ukraine, namely: Volyn, Zakarpattia, Ivano-Frankivsk, Lviv, Ternopil, Rivne, Chernivtsi, Donetsk and Luhansk regions. At the same time, as at the end of January 2021, there were 104,655 subscribers in Ukraine who exercised their right to freely choose a mobile operator by using the Number Portability Procedure (65,965 numbers were ported in 2020), which remained almost the same compared to 2020 and 2021, despite the introduction of martial law in the country. The transition of subscribers to cheap tariffs is explained by a decrease in the purchasing power of the population and encourages people to save in all areas [11-13].

To sum up, it should be noted that the overall decline in the number of mobile subscribers was driven by the following factors:

1. Refusal to use an additional SIM card. This trend in the mobile market has recently been observed in the most influential operators, whose mobile packages include relatively large packages of calls to other networks, thus declaring that there is no need to have an additional SIM card to make calls to other networks. As a result, the number of SIM cards is gradually decreasing, while the level of profitability of each card is increasing.
2. Smartphones and messengers. Almost every smartphone has some kind of mobile application installed, and some have several. The widespread use of mobile communication services, as well as computer programs and mobile applications that allow consumers of Internet access services to replace traditional voice services with voice and video services using the Internet (such as Google Meet, Zoom, Microsoft Team, WhatsApp, Telegram, etc.) directly or indirectly, affects the slow decline in the subscriber base of the provider of these services. According to the analysis of statistical data, the rating of frequently used mobile applications is shown in Table 2.

**Table 2. Market coverage dynamics by the most frequently used applications, 2018-2022.** (Source: calculated by the authors based on sources [29])

Mobile application name	Coverage, %					Rates of growth (decrease), %				
	2018	2019	2020	2021	2022	2018 to 2019	2019 to 2020	2020 to 2021	2021 to 2022	2022 to 2018
Chrome	85.4	93.2	98.8	98.5	98.9	109.1	106.0	99.6	100.4	115.8
Gmail	73.8	91.3	98.7	98.7	98.8	123.7	108.1	100	100.1	133.8
Viber	93.6	96.4	97.9	98.0	98.2	102.9	101.5	100.1	100.2	104.9
YouTube	84.2	93.2	97.4	98.6	98.1	110.6	104.5	101.2	99.4	116.5
Facebook	64.8	79.9	94.6	94.9	94.8	123.3	118.3	100.3	99.8	146.2
Google Maps	66.3	76.1	92.8	90.8	93.3	114.7	121.9	97.8	102.7	140.7
Telegram	27.5	56.9	85.7	88.8	94.1	206.9	150.6	103.6	105.9	342.1
Instagram	47.6	66.2	80.2	78.9	79.5	139.0	121.1	98.3	100.7	167.0
Privat24	57.0	74.5	78.3	76.7	80.0	130.7	105.1	97.9	104.3	140.3
Messenger	55.3	69.7	75.5	74.4	75.5	126.0	108.3	98.5	101.4	136.5
OLX.ua	32.8	43.1	54.8	52.2	53.6	131.4	127.1	95.2	102.6	163.4
Nova Poshta	10.4	30.9	54.8	55.3	59.0	257.4	177.3	100.9	106.6	491.6
Google Pay	-	10.6	31.7	53.2	60.9	574.5	299.0	167.8	114.4	574.5
AliExpress	25.0	25.2	46.8	44.3	45.1	180.4	185.7	94.6	101.8	180.4
WhatsApp	22.1	30.2	45.3	47.4	48.4	136.6	150	104.6	102.1	219.0
My Kyivstar	7.2	16.3	45.2	48.5	48.2	226.3	277.3	107.3	99.3	669.4
Monobank	-	21.4	43.9	47.7	55.0	257.0	205.1	108.6	115.3	257.0
My Vodafone	6.5	29.2	40.7	40.0	46.6	449.2	139.3	98.2	116.5	716.9
TikTok	-	2.1	36.8	44.9	51.7	2461.9	1752.3	122.0	115.1	2461.9
Diia	-	-	29.7	73.9	83.7	-	-	248.8	113.2	281.8

According to the analysis of data in Table 2, the coverage of Facebook and Telegram applications showed rapid growth during the research period (Facebook coverage increased from 65% in 2018 to 80% in 2019, and Telegram increased from 27.5% to 46.7%). However, in 2020, the ranking of mobile apps in Ukraine changed slightly: while in 2019 it was Viber with 96.4% of users and YouTube with 93.2%, in 2022, Chrome and Gmail took the lead with 98.8% and 98.7% of users, respectively.

At the same time, Telegram is showing a positive trend towards growing popularity, outperforming Instagram, while the messenger has increased its coverage from 17% to 86% and ranked 7th in the popular apps ranking scale.

Alongside the growing use of Privat24 and Monobank internet banking, Ukrainians are increasingly using their smartphones for contactless payments. In 2019, 11% of the population used the Google Pay app, and in 2020 this figure reached 48%. At the same time, mobile operators are developing their own messengers, with two mobile operators such as Kyivstar and Vodafone in the ranking with their own apps. The TikTok app showed the fastest growth rate by 18 times over the past 3 years. Since September 2021, the population of Ukraine has been increasingly using the Diia electronic public service application, whose consumer audience has grown to 54% of all global network users [7].

The rating of app usage changed dramatically after 24 February 2022. Ukrainians downloaded safe messaging apps in large numbers. The most popular apps downloaded as of today are those for air threat alerts: Air Alert, Telegram, Twerk Race 3D, and Signal.

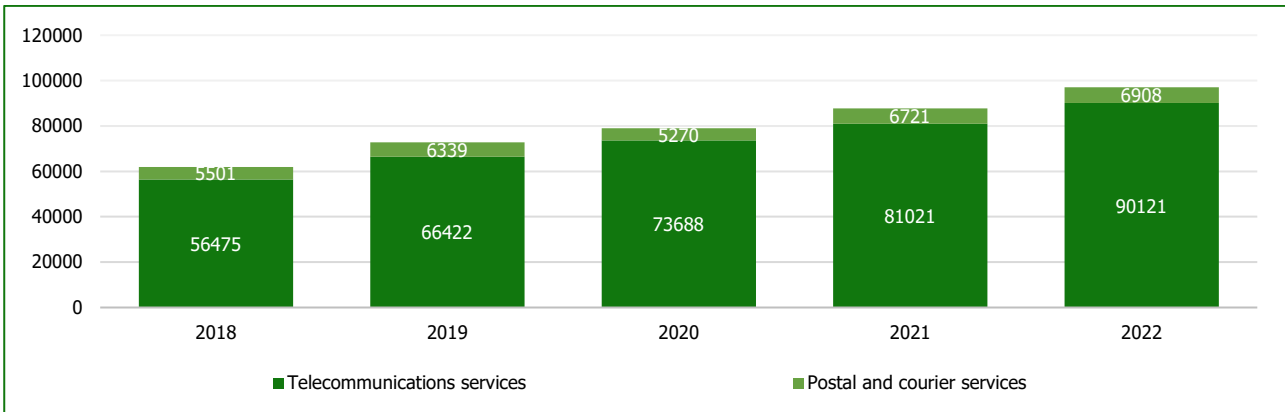
SpaceX activated the Starlink service in Ukraine and sent the necessary equipment, and as a result, on 12 March, Starlink entered the top ten most popular apps in Ukraine.

To summarize the above, it should be mentioned that the key factor for the intensive growth in the number of fixed-line Internet access points was the spread of the COVID-19 pandemic in Ukraine and other countries. In order to introduce preventive measures against the spread of the disease in Ukraine, in 2020, a significant number of enterprises changed their work format to remote, which, in turn, required high-quality, high-speed and stable Internet access at home. The above has led to an increase in the number of users of modern electronic services in the areas of administrative services, e-commerce, healthcare, and education, such as e-Gov, e-Ticket, bank-ID, mobile-ID, GooglePay, ApplePay, e-Health, etc. At the same time, demand for language learning apps such as Duolingo and Busuu also increased in Ukraine in 2022 [13].

It is a well-known fact that the profitability and efficiency of Ukrainian telecommunications enterprises are formed as a result of ensuring a high level of performance in the provision of various types of services, such as postal services and telecommunications services. By comparing the level of profitability of communication services, it should be stated that the bulk of revenues is generated by telecommunications services, which account for over 93% of the total structure of communication services.

According to the data in Figure 3, a positive trend is observed towards a stable increase in the level of income from the communication services' provision over the past 5 years (by 45.4%). Based on the analysis of revenues' dynamics and structure from communication services provision for the studying period, we note that in 2020, the level of revenues from the postal services provision and courier services decreased slightly due to a decrease in the volume of written correspondence and active use of digital marketing and e-commerce services. An example is the "Nova Poshta" positioning, which provides services for the formation and optimization of humanitarian flows within Ukraine. The consequences of the significant movement of the population outside of Ukraine caused Nova Poshta to concentrate its efforts on the foreign market (the company returned 90% of its sales volume through financial investment in new directions) [9-10].

According to the data of Figure 3, there is a positive trend towards a steady increase in the level of revenues from the provision of communication services over the past 5 years by 45.4%. Based on the analysis of the dynamics and structure of revenues from the provision of communication services for the period under review, one should note that in 2020, the level of revenues from postal and courier services slightly decreased due to a decline in the volume of written correspondence and the active use of digital marketing and e-commerce services. An example of this is Nova Poshta, which provides services for the formation and optimization of humanitarian flows within Ukraine. The consequences of the significant movement of the population outside of Ukraine caused Nova Poshta to concentrate its efforts on the foreign market (the company has returned 90% of its sales and is investing in new directions) [9-10].



**Figure 3. Dynamics and structure of revenues from communication services in 2018-2022, UAH mln.** (Source: compiled by the authors based on sources [29])

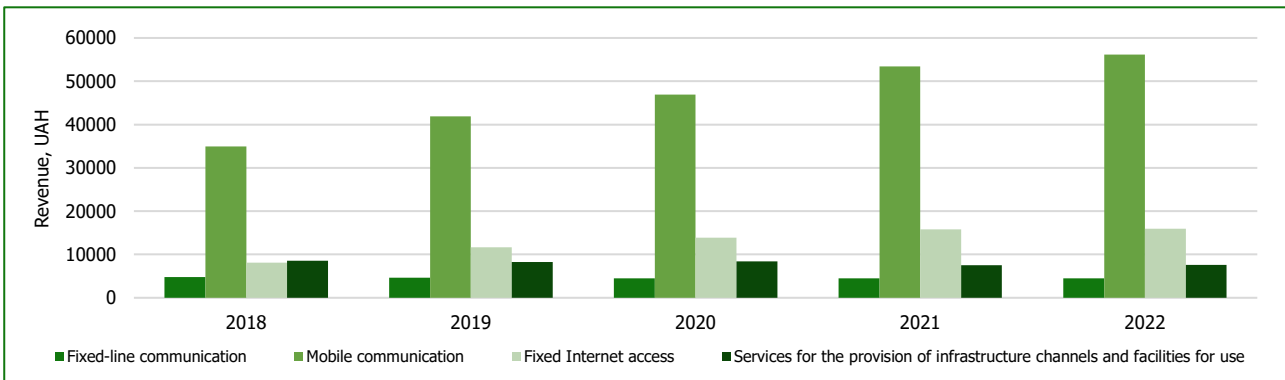
The analysis of the key indicators of the telecommunications services market has shown a trend of generating revenues of telecommunications enterprises in Ukraine by providing various types of services:

- fixed-line telephone services;
- mobile communication services;
- fixed-line Internet access services;
- services for the provision of channels, infrastructure, etc. for use (Table 3).

**Table 3. Dynamics of the level of profitability from the provision of telecommunication services for the period from 2018 to 2022, UAH mln.** (Source: calculated by the authors based on sources [12; 28])

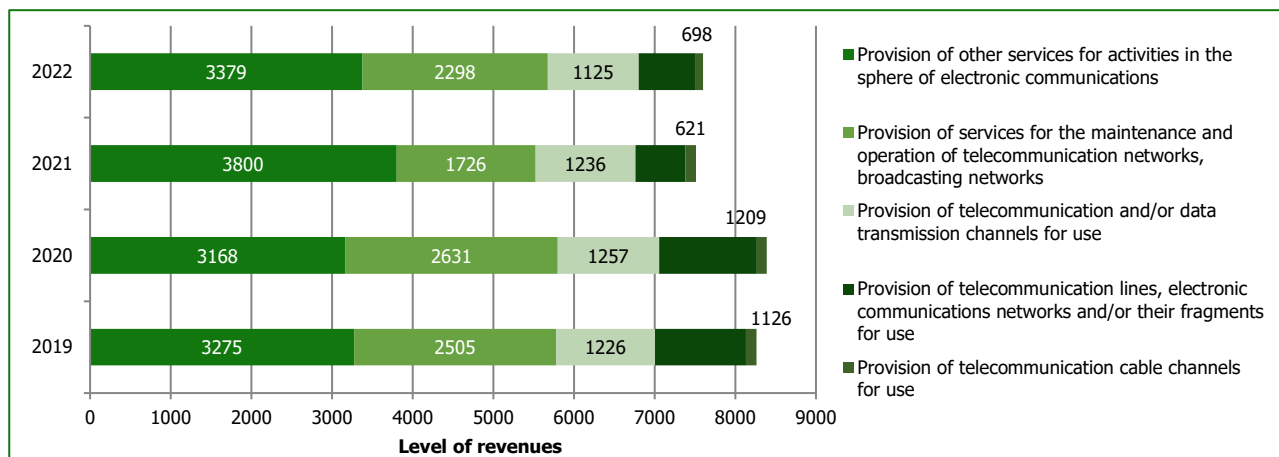
Indicators	Revenue, UAH mln.										Growth/decrease rate, %
	2018	%	2019	%	2020	%	2021	%	2022	%	
Fixed-line telephone services	4786	8.5	4606	6.9	4485	6.1	4242	5.2	3493	4.2	72.98
Mobile communication services	34978	61.9	41868	63.0	46943	63.7	53460	66.0	56192	67.6	160.65
Fixed-line Internet access services	8136	14.4	11688	17.6	13870	18.8	15807	19.5	15928	19.1	195.77
Services for the provision of channels, infrastructure, etc. for the use	8575	15.2	8260	12.5	8390	11.4	7512	9.3	7600	9.1	88.63
Total	56475	100	66422	100	73688	100	81021	100	83213	100	147.34

Overall, in 2022, the level of profitability of telecommunications market enterprises increased by more than 47% (UAH 83213 million) compared to 2018. In the structure of revenues from telecommunication services, mobile communications accounted for the largest share (over 67%). The difference in the share of revenues from Internet access services in 2022 compared to 2018 was 4.7%, which in monetary terms is an increase of UAH 7792 million, i.e., almost 50% (Figure 4).



**Figure 4. Dynamics of revenues of enterprises from the provision of telecommunication services in 2018-2022, UAH mln.** (Source: compiled by the authors based on sources [7; 12; 28])

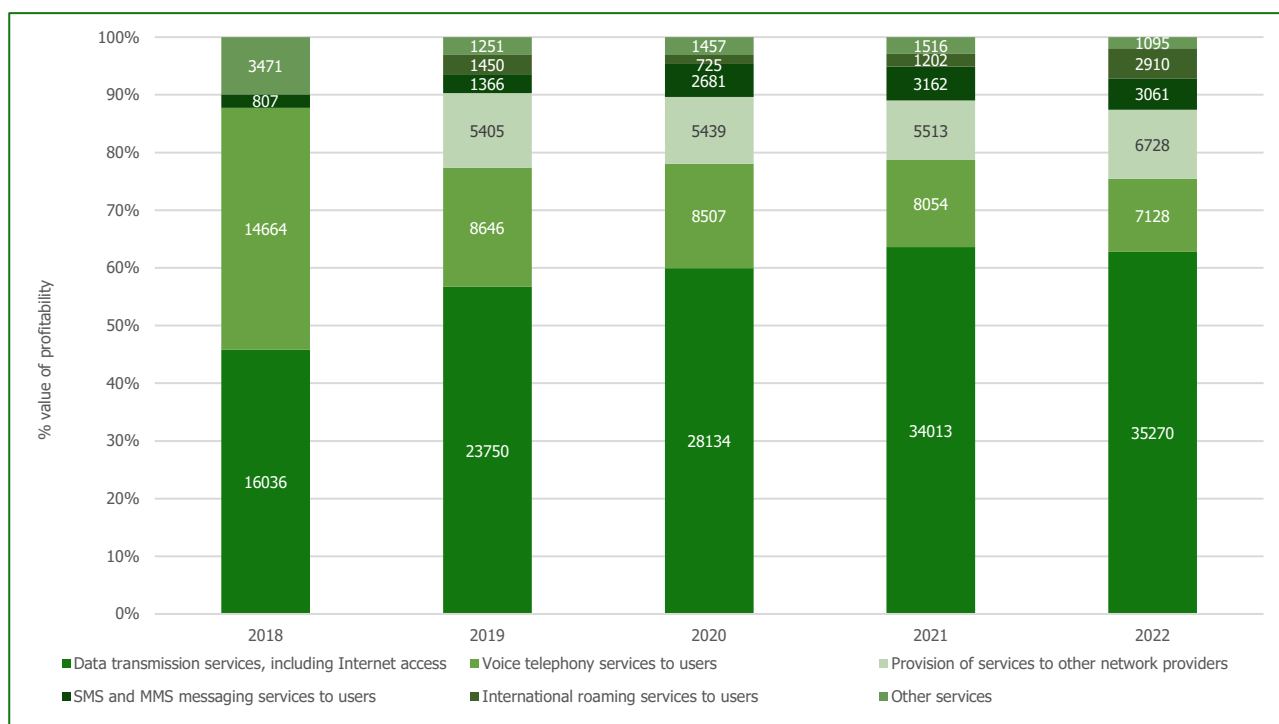
In 2022, total revenues from the provision of services for the use of telecommunication channels amounted to UAH 7,600 million, which is 0.2 percentage points lower than in 2021. It should be noted that in the structure of revenues, the largest share was made up of revenues from the provision of services for electronic communications, namely 44.5%. In 2020, this figure was UAH 8,390 million, and the largest share in the revenue structure was made up of revenues from the provision of broadcasting services, including television and radio broadcasting - 31.4%. Compared to 2019, the share of revenues from technical and technological maintenance and operation of telecommunication networks, broadcasting networks, and radio networks decreased by 2.7 percentage points (Figure 5).



**Figure 5. Level and structure of revenues from the use of telecommunication services for the period from 2019 to 2022, UAH mln.**  
(Source: compiled by the authors based on sources [12-16])

A significant decline in consumer demand for wired radio broadcasting services has led to positive trends in the revenues of enterprises providing mobile telecommunications services, which in 2022 amounted to UAH 56192 million, while the share of total revenues from the provision of telecommunications services was 67.7%.

In the structure of revenues from mobile telecommunications services, the largest shares were revenues from data transmission services, including Internet access - 62.8% and revenues from providing voice telephony services to potential users - 12.7% (Figure 6).

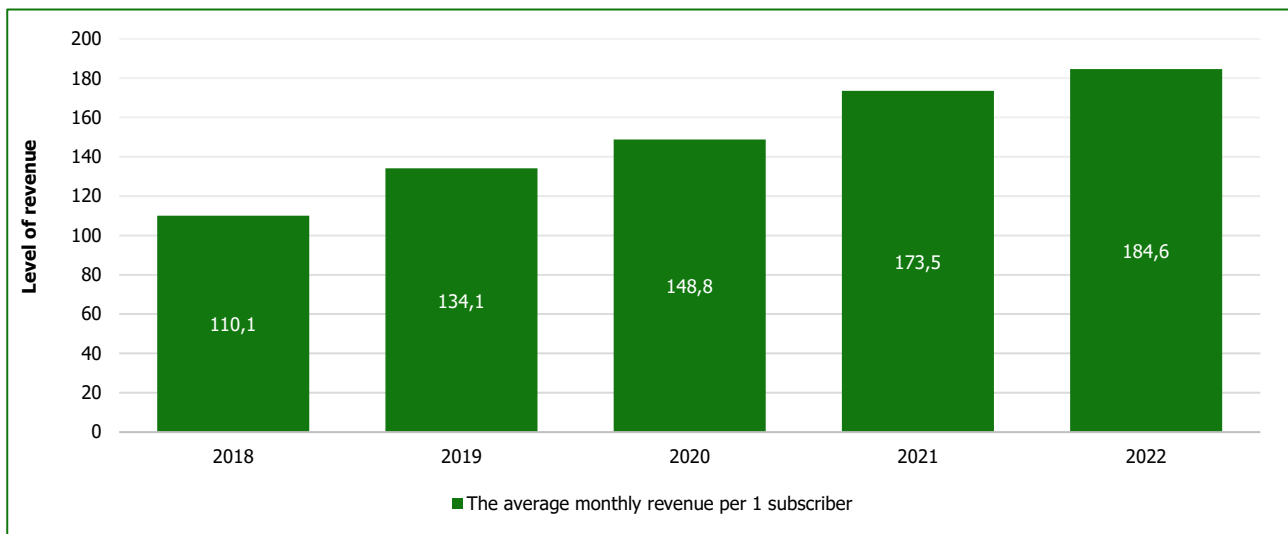


**Figure 6. Dynamics of the level and structure of revenues of mobile operators (2018-2022), UAH mln.**  
(Source: compiled by the authors based on sources [14; 17])

According to Figure 6, there is a positive trend towards an increase in the level of revenues from the provision of data transmission services, including access to the World Wide Web (3.2%), which, in general, shows a positive trend (an increase of 120%).

The rapid growth (by 2.4 times in 2022) in the level of profitability of international roaming service providers is explained by the forced migration of the Ukrainian population to the European Union and other countries. At the same time, the indicator of voice telephony services provided to consumers decreased by 2.4 percentage points in 2022 compared to the previous year 2021 [20-21].

According to telecommunications operators and providers, in 2022, revenues from fixed Internet access services decreased by 0.4 percentage points and amounted to UAH 15928 million (19.1% of total revenues from telecommunications services) (see Table 3). As a result, the level of average monthly revenue from fixed-line Internet access services per subscriber increased (Figure 7).



**Figure 7. Dynamics of the average monthly revenue from fixed-line Internet access services per 1 subscriber, UAH/month.** (Source: calculated by the authors based on sources [12-14])

The analysis of the figure shows a consistently positive trend (in 2022, the average monthly revenue from fixed-line Internet access services per subscriber increased by 6%, and compared to 2018, this figure increased by 67.7%).

Noting the significance of the consequences of the full-scale invasion of the aggressor, it should be mentioned that in the context of large-scale destruction of energy infrastructure facilities and global power supply problems, there has been an increase in demand for xPON technologies, which provide remote power supply to subscriber endpoint equipment, as well as for means to restore and reconstruct destroyed networks.

Under such critical conditions, mobile service providers lost the total number of active SIM cards (by 12% in 2022), namely [22-24]:

- used to receive M2M services, due to the occupation of the territories of Ukraine (decrease by 6.4%);
- used to access the Internet (down 6.6%), which at the end of 2022 amounted to 35.356 million units, of which almost 27 million were 4G cards;
- an increase in the number of Ukrainian subscribers in roaming (2.5 times).

## DISCUSSION

The communications industry plays an important role in the economic and social revival of the country in the context of increasing the level of globalization, intellectualization and informatization of society. Telecommunications ensure effective management of public, production and non-production processes of social activities, thereby expanding opportunities for communication from anywhere in the world, successful education and business activities while optimizing costs and ensuring a high level of economic security not only in the offline but also in the online environment of enterprises.

Communications enterprises are more interested in development than enterprises in any other industry. One of the main reasons is that the competitiveness of enterprises depends not only on the quality of infrastructure but also on its compliance with technological advances.

The role of the communications industry in financial growth and social inclusion is becoming increasingly important not only in Ukraine but also in the whole world. The development of the communications industry contributes to the rapid spread of digital technologies by expanding the capabilities of the Internet and broadband access, which, in turn, leads to the removal of barriers to e-commerce, commerce, online communication, and business digitalization. Examples of such positive impact include increased access to financial services through micro-payments using the funds on the mobile phone account of a subscriber, digital technologies for small businesses, innovative systems in the healthcare and education and science systems, and an ever-growing number of electronic government services.

The financial stability and efficiency of domestic telecommunications enterprises also depend on the impact of both positive and negative global and local trends, a bright example of which is an extremely rapid development of the information society, the technological foundations of which are telecommunications and information technologies, which have become the leaders of technological progress, an integral element of information modern technologies, contribute to economic growth, create conditions for the free circulation of large amounts of information and knowledge in society, cause significant socio-economic transformations and, ultimately, the formation of an information society.

At the same time, in the nowadays conditions of science and technology development, telecommunication technologies have turned into one of the most important subjects of information relations. To a large extent, the development of telecommunication technologies has simultaneous negative manifestations - such as an increase in the facts of illegal collection and use of information, unauthorized access to information resources, violation of information processing technologies, launch of virus programs, destruction and modification of data in telecommunication systems, interception of information in the technical channels of its leakage.

It is worth disagreeing with such authors as Kulakov, V. O. and Shchebelskaya, V. O., Nasibova, O. V. and Ivashkevich, I. O., who point out the high level of unpromising of the industry, because exactly deregulation, globalization, introduction of new technologies such as mobile phones and broadband have forced the telecommunications companies to reconsider their strategy, their technological base and their product portfolio. In that context, companies have tried to develop and gain access to desired capabilities and resources and expanded across national boundaries to sustain their competitive advantages. Companies that lack some of the necessary new competencies used mergers, acquisitions, and partnerships with other companies to acquire essential technological knowledge and to penetrate new markets.

In today's difficult economic and socio-political conditions in order to provide high-quality, prompt, comprehensive and affordable communication services, taking into account the formation of a system for ensuring sustainable protection of information resources in the telecommunications network, operators participating in the telecommunications market must, first of all, maintain the pace of implementation and development of telecommunications facilities and quickly adapt to constantly changing environmental conditions, analyze all potential financial opportunities and conditions for providing new services, making optimal management decisions in a timely manner based on endogenous and exogenous factors of influence and possible negative consequences of world information processes development.

## CONCLUSIONS

Globalization and intellectualization of social processes have a significant impact on accelerating the development of scientific and technological progress in general and in the telecommunications industry in particular. That is why the successful functioning and development of the national telecommunications industry in extremely difficult socio-political and economic conditions is of priority importance.

Given that the primary requirement of the modern information society is the constant and dynamic growth of consumer needs in the direction of using high-quality, safe, high-speed telecommunications services, the analysis of trends in the development of the domestic telecommunications market in recent years allows us to trace the presence of geospatial and sectoral structuring, accompanied by complex transformational and structural changes.

In view of the current trends, the achievement of the target development benchmarks of telecommunications enterprises directly depends on the global information influence, taking into account this aspect in the business activities of business entities in the target market. Therefore, in the current conditions, strategic vectors of development of telecommunications enterprises are of great importance, considering industry specifics and peculiarities of the formation of the modern business environment for the long term.

It was determined that during the research period of 2018 to 2022, the level of profitability of the communications market enterprises increased by more than 47%. Comparing the level of profitability of communication services, it should be noted that the bulk of revenues are generated by telecommunications services and account for more than 93% of the total structure of communication services.

Thus, in 2022, revenues from the provision of communication services amounted to UAH 90,121 million, of which income from the provision of electronic communication services was UAH 83,213 million, and revenues from providing services postal services — UAH 6,908 million. At the same time, in the structure of income, the largest share is 92.3% made electronic communication services, share of income from the provision of postal services communication — 7.7%.

The rapid decline in the number of fixed-line telephone subscribers is due to the widespread use of mobile services. The gradual expansion of the geographical coverage of 4G and 5G networks is contributing to the replacement of traditional fixed-line telephony services, which ultimately leads to a decrease in demand for fixed-line telephony services. In the structure of income from the provision of electronic communication services in 2022 the largest shares were: mobile communication — 67.6% and fixed access to the Internet — 19.1%. Mobile shows the greatest growth connection, the difference in the shares of his income in 2022 compared to 2021, which was 1.6 per cent points.

A key feature of the revenue formation of organizations in the communication market is the presence of static trends to increase income from the provision of mobile communication services due to an increase in the level consumption of data transmission services, including access to the Internet and international networks roaming. That is why the mobile communications market remains a priority area for development, gradually increasing the volume of services, improving their quality, diversifying them, and making them secure, massive, publicly available and tailored to the individual needs of each potential user. The realization of new opportunities is ensured both by improving the existing networks and by implementing new technical and technological solutions related to the formation of the global network infrastructure.

The analysis of key indicators of the telecommunications services market showed a tendency to generate revenues for telecommunications companies in Ukraine by providing various types of services, namely: fixed-line telephony, mobile telephony, fixed-line Internet access services, and services for the provision of channels and infrastructure facilities for use. It was determined that a significant number of customers are switching to the services of large market participants (providers), where the largest percentage of services is provided by wired Internet services, while small telecommunications market participants (operators) are not able to provide an adequate level and continuity of service.

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## ADDITIONAL INFORMATION

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## ОСОБЛИВОСТІ ФОРМУВАННЯ ДОХОДІВ ОРГАНІЗАЦІЙ РИНКУ ТЕЛЕКОМУНІКАЦІЙ

Теоретико-методологічною базою, представленою в статті, є ідентифікація особливостей формування доходів учасників ринку телекомунікацій, виявлення потенційних можливостей і загроз забезпечення їхньої економічної безпеки з метою пошуку ефективних напрямів розвитку галузі зв'язку в довгостроковій перспективі.

Дослідження проводилося на матеріалах щодо результатів діяльності національних телекомунікаційних підприємств. Методичну основу дослідження склали загальні та спеціальні методи, а саме: системний аналіз – для комплексного врахування стратегічних орієнтирів діяльності підприємств зв'язку; узагальнення та наукової абстракції – для вивчення рівня готовності підприємств до змін у системі організаційно-економічного управління в напрямі інноваційного розвитку; статистичний аналіз (метод стандартного відхилення), синтез і порівняння – для дослідження вітчизняного телекомунікаційного ринку, діагностики сучасного стану та тенденцій інноваційного розвитку вітчизняних телекомунікаційних підприємств, визначення пріоритетних напрямів розвитку інноваційних рішень у напрямі формування високого рівня доходності учасників ринку комунікацій.

Упродовж ідентифікації потенційних можливостей діяльності за умов наявності релевантного ресурсно-компетенційного потенціалу галузі встановлено, що невеликі учасники ринку зв'язку (оператори) не здатні забезпечити належний рівень і безперервність обслуговування, тому значна кількість клієнтів використовує послуги крупних учасників ринку (провайдерів), у яких найбільший відсоток надання послуг припадає на послуги дротового Інтернету. На основі проведеного аналізу ринку телекомунікацій і діагностики умов та перспектив діяльності операторів-учасників визначено суттєве скорочення кількості операторів, провайдерів телекомунікацій за період із 2018 по 2022 рік.

У результаті аналізу тенденцій розвитку ринку зв'язку в Україні визначено, що важливим питанням сьогодення є реалізація стартапів із реорганізації, реконструкції, оптимізації та вдосконалення телекомунікаційних мереж, у результаті чого повинен відбутися інноваційний перехід до застосування сучасного комутаційного обладнання з високим показником продуктивності для забезпечення належного рівня обслуговування одразу кількох зон нумерації та підтримання доступності до широкого діапазону послуг, що дасть змогу досягти високого рівня доходності в найближчому майбутньому.

**Ключові слова:** ринок телекомунікацій, телекомунікаційні підприємства, доходність операторів ринку зв'язку, ринок мобільного зв'язку, послуги електрозв'язку, оператори телекомунікацій, телефонний фіксований зв'язок, рухомий мобільний зв'язок

**JEL Класифікація:** D89, F69, L10, L96, O39